

NOAA, NATIONAL WEATHER SERVICE, WEATHER FORECAST OFFICE

Miami, Florida 33165

South Florida Flooding and Severe Weather

December 17-18, 2009

The active southern branch of the jet stream so typical of El Nino events produced a textbook example of a wintertime low pressure system in the Gulf of Mexico on Thursday, December 17, 2009. This low deepened as it moved northeast toward Apalachee Bay, pushing a warm front northward across the Florida peninsula where temperatures and moisture had been well above normal for more than a week.

On the evening of Thursday, December 17, 2009, precipitable water values on the Miami upper air sounding were more than two standard deviations above normal for mid December, generally around 1.8 inches, prompting National Weather Service forecasters at the Weather Forecast Office (WFO) in Miami to issue statements and outlooks calling for the possibility of heavy rains Thursday night and Friday as the low pressure system moved eastward. However, no one expected more than 10 inches of rain to fall in very localized neighborhoods of eastern Broward and extreme northeast Miami-Dade counties, which is what happened. A boundary between very warm, moist and unstable air over the Atlantic coastal waters (including the warm Gulf Stream) of southeast Florida and cooler more stable air over the land areas of southeast Florida provided a focus persistent thunderstorms from around 5 PM EST through 10 PM EST. These thunderstorms dropped torrential rainfall amounts, but in a very limited area near the coastline. The graphic below, which is a storm total estimated rainfall product from the Miami National Weather Service Doppler radar (WSR-88D) ending at 8 AM EST on Friday, December 18, shows clearly the limits of the heaviest rainfall.

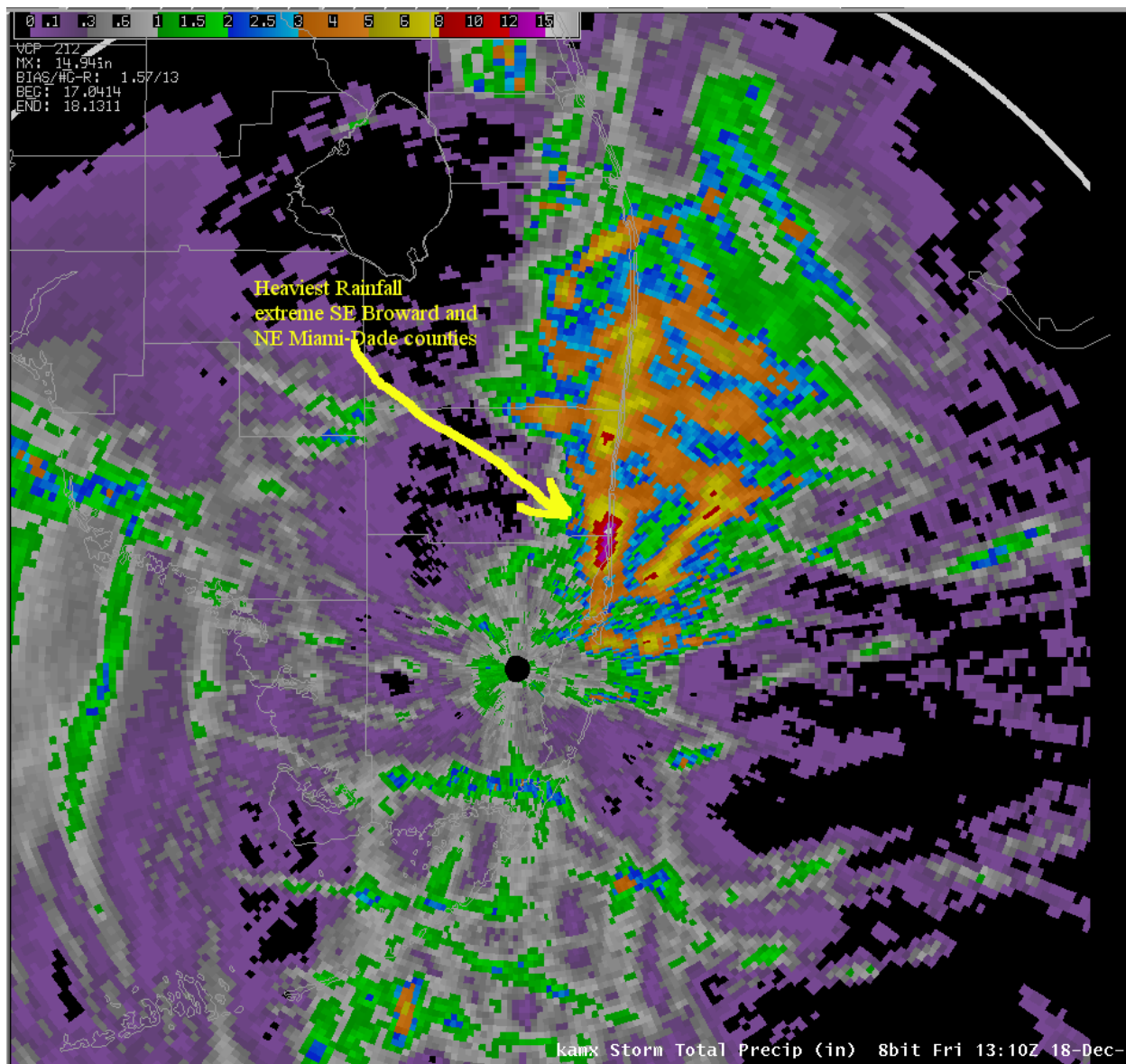


Figure 1 - Storm Total Rainfall from 11 PM Dec. 16 through 8 AM EST Dec. 18

From this product, one can clearly see rainfall estimates in excess of 10 inches in a very small area of extreme southeast Broward County (Hallandale Beach and parts of Hollywood) and extreme northeast Miami-Dade County (Aventura and extreme north North Miami Beach). Rainfall was estimated greater than 3 inches in all locations along and east of I-95. West of I-95, the rainfall diminished very quickly, and up through 8 AM EST on Friday almost no rain had fallen in the western suburbs of Broward County.

Below are some reported rainfall totals through 7 AM EST Friday, December 18, 2009

North Miami Beach S-29 (SFWMD)	14.25 inches
Hollywood (NWS coop)	13.32
Fort Lauderdale-Hollywood Intl AP (KFL)	7.74
Pompano Beach CoCoRAHS	6.72
Pompano Beach Airport (KPMP)	5.45
North Miami Beach (NWS coop)	2.03 (to show small scale)
Coconut Creek S-37B (SFWMD)	7.42
Oakland Park S-37A (SFWMD)	5.42
Delray Beach S-40 (SFWMD)	5.82
West Boca Raton S-39 (SFWMD)	4.66
Boynton Beach S-41 (SFWMD)	5.29

In addition, the Storm Prediction Center issued a Tornado Watch valid from 745 AM EST until 1 PM EST for all of mainland South Florida. The NWS Weather Forecast in Miami issued several tornado warnings throughout the morning, one for Collier County that was cancelled after the storm weakened and three for Miami-Dade County. One strong thunderstorm for which a tornado warning was issued at 1027 AM EST for the Homestead Speedway and Homestead Bayfront Park areas of extreme southeast Miami-Dade County moved across Coral Gables and the City of Miami with 40-45 mph winds, continuing northeast to North Miami Beach by 11 AM. Strong straight line wind gusts or possibly a brief “gustnado” at the corner of NE 163rd Street and Biscayne Boulevard resulted in two injuries reported from flying glass after an awning was blown into a gas station’s pumps. Another tornado was verified in extreme South Miami-Dade near the Homestead Speedway (near SW 328 St. and SW 132 Ave.).